Adapting the Science Shop Concept towards Sustainability: A Case Study of FYP SDG @ UM

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Problem Statement

There is limited literature regarding responsible innovation in Malaysia and this study would be a notable pilot project for implementing the RRI perspective in Malaysia (which has yet to be done academically) together with a regional perspective.

The intention of this project is to validate a framework for developing socially desirable innovations, diffusing it effectively to meet the specific needs of farming communities and build pathways to reintegrate innovative human capital into their regional communities for them to make contributions to regional sustainable development.

The process is founded on integrating elements of the Dutch **Science Shop**, dimensions of **Responsible Innovation** (anticipation, reflection, deliberation, and response), within the context of **Sustainability** (Owen et al. 2013).

To validate the concept, the study was be conducted using an action research model that aims to mobilize FYP students to address such research problems in a social experiment. The project would map FYP projects towards addressing SDGs in an integrated monitoring platform.

Concept Development

- Workshopped at the BCG Researcher Network meeting in Bangkok 2023
- Funded by the Ecocampus Living Lab Grant 2023 (RM25,000)
- Funded by Fundamental Research Grant Scheme 2024 (RM99,400) for deployment in Gemas, Jelebu and Kuala Sepetang.
- Funded by Ecocampus Living Lab Grant 2024 (RM25,000) **(MANDATED)**
- Presented at:
  - STS Global Conference 2024 (Singapore)
  - IRRS RIHED Symposium 2024 (Bangkok)

Literature Review

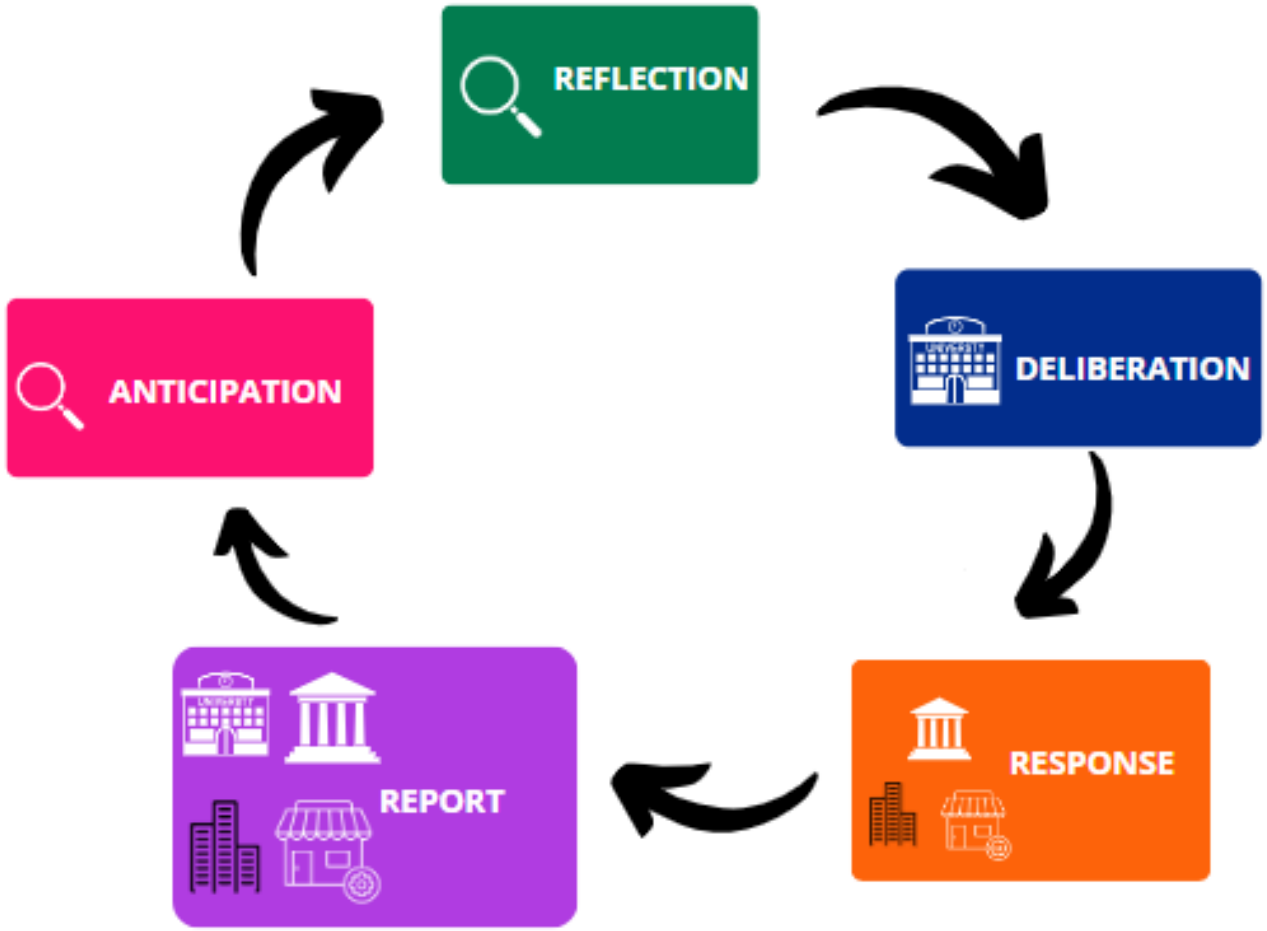
The literature discusses the drivers, tools, outcomes, and barriers to RRI, particularly with regard to regional innovation (Thapa et al. 2019).

As discussed, the discussion surrounding RRI at this point, typically discusses the debate and diffusion of emerging technologies as well as the consequences of these technologies on society (Thapa et al. 2019). However, there are limited studies on how such an approach can be implemented in regional innovation (Thapa et al. 2019).

Though studies have discussed the unintended consequences of research and innovation (Rodriguez-Pose 2018; Storper 2018) there are less studies on the concept of neglect and 'being left behind', particularly in the ASEAN context. Regional culture is increasingly being studied as a key interactional aspect of the innovation system (Asheim & Gertler, 2006; Tödtling & Tripple, 2011; Tödtling et al., 2022).

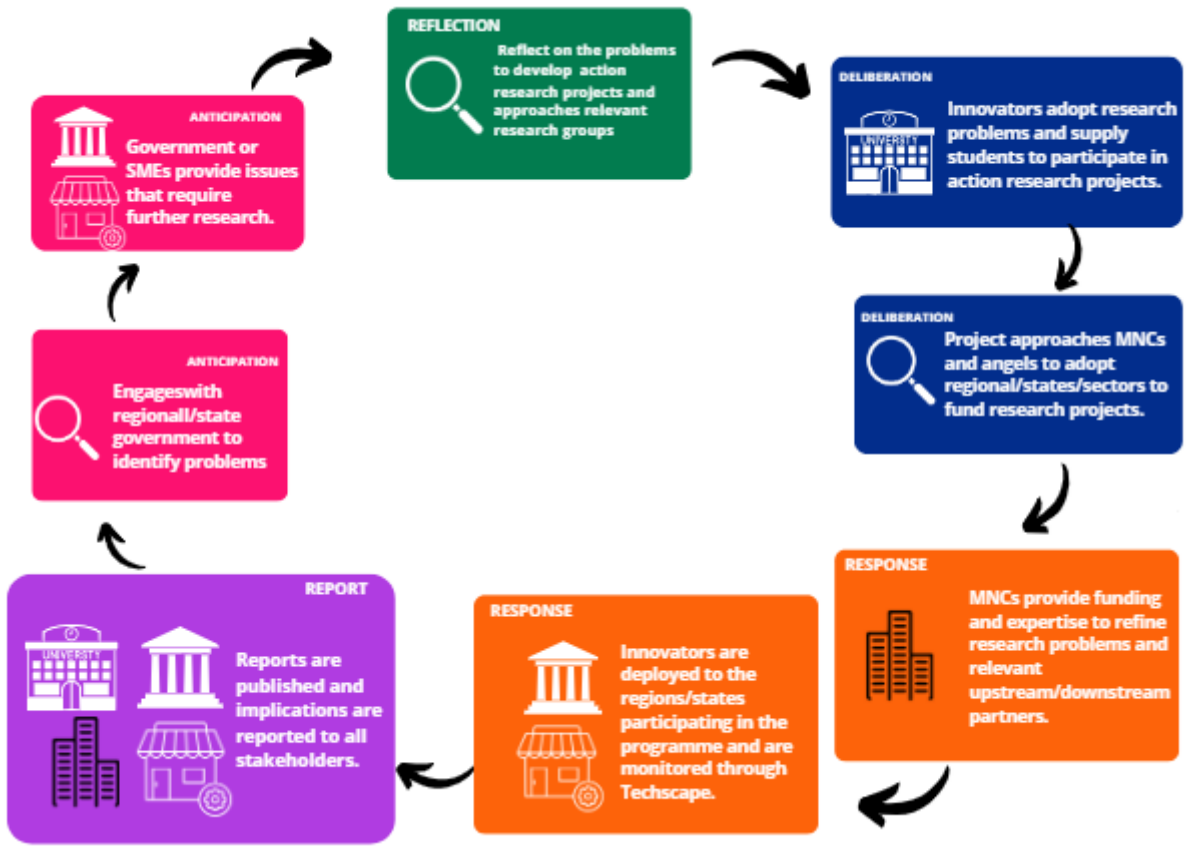
These academics contend that one of the main explanations for actors' performance in innovative activities is the culture that is ingrained in a nation's society. According to Lee, Florida & Gates, (2010), human capital significantly contributes to innovation and creativity. Indeed, highly skilled human capital has the potential to greatly affect the innovative performance of a firm (Fonseca, Faria, & Lima, 2019).

Framework



Owen et al. 2015; Stilgoe et. al 2013

Framework


REFLECTION
Reflect on the problems to develop action research projects and approaches relevant research groups
DELIBERATION
Innovators adopt research problems and supply students to participate in action research projects.
DELIBERATION
Project approaches MNCs and angels to adopt regional/states/sectors to fund research projects.
RESPONSE
MNCs provide funding and expertise to refine research problems and relevant upstream/downstream partners.
RESPONSE
Innovators are deployed to the regions/states participating in the programme and are monitored through Techscape.
REPORT
Reports are published and implications are reported to all stakeholders.
ANTICIPATION
Engageswith regionall/state government to identify problems
ANTICIPATION
Government or SMEs provide issues that require further research.

FYP SDG @ UM

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Background

- To **support 50 Final Year Projects (FYP)** to address campus sustainability issues in UM.
- The theme for 2023/2023 Academic Year is "**Just Net-Zero and the SDGs**"
- To train students in conducting **action-oriented research** and to be proactively involved in solving real world sustainability challenges.
- To empower the role of students to **accelerate** UM's transition towards a sustainable and net-zero campus.

Policies to transform UM into a “model city campus” in advancing sustainable, green and carbon-neutral innovation and lifestyle

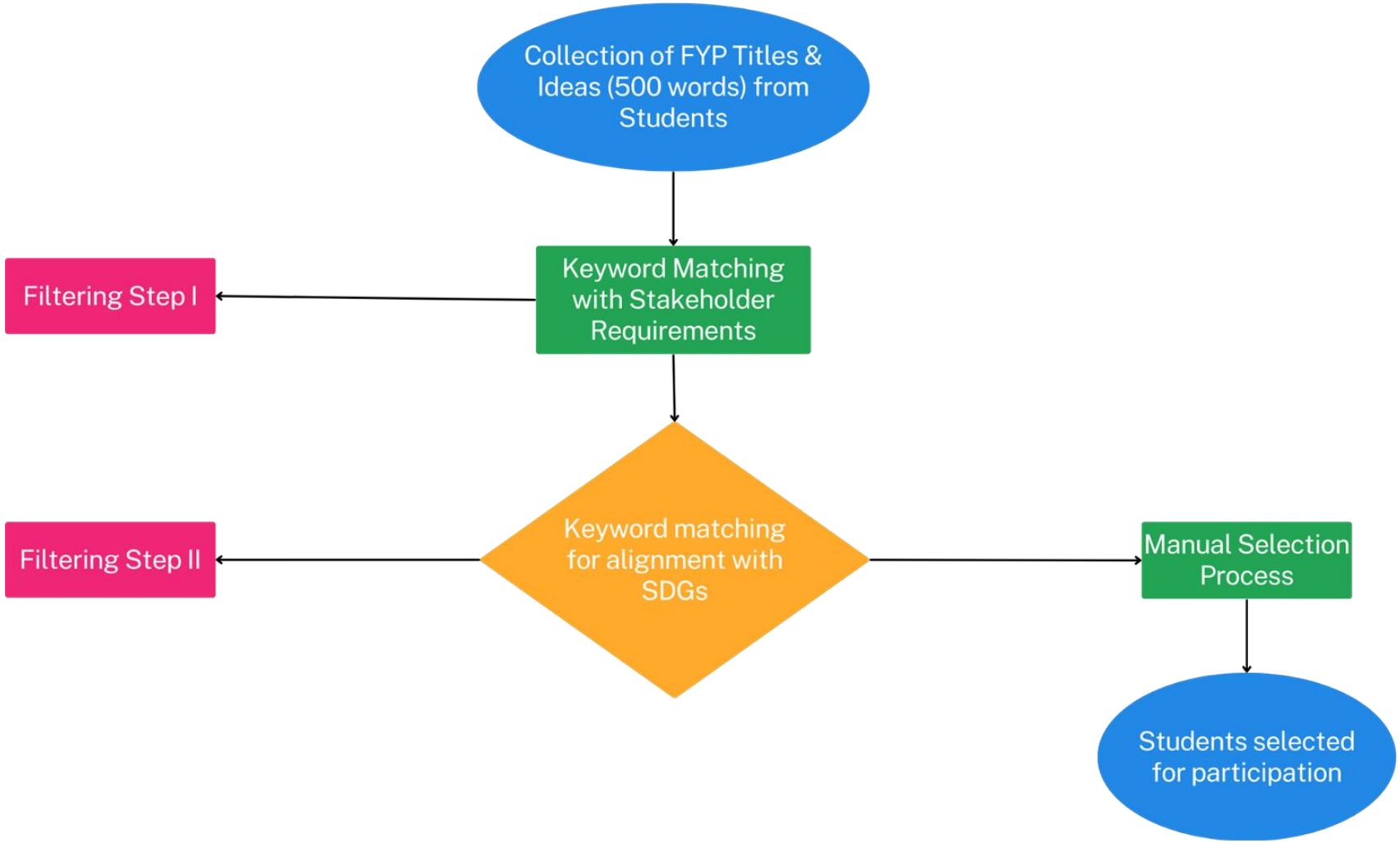
Universiti Malaya Eco-Campus Blueprint
Pelan Pembangunan Eko-Kampus Universiti Malaya

Universiti Malaya Sustainability Policy 2021 - 2030
Dasar Kelestarian Universiti Malaya 2021 - 2030

Mechanism

- Theme: **Just Net-Zero and the SDGs**
- Students chosen among those undertaking their FYPs in **Semester 1 and/or 2, Academic Year 2023/2024**
- Open to students from **all faculties** in UM, with cumulative GPA 3.0 and above.
- Every programmes are encouraged to have at least **2 students** to submit abstracts, together with a statement on why they are interested to join the programme.
- Abstracts will go through a systematic **selection process**.
- The **best 50 FYP** submissions will be selected for the **special incentives**. However, students that are not in the Top 50 will still be eligible for the **general incentives.**
- Consideration will be given to ensure that students are selected from a **diverse mix of programmes and faculties.**

Selection Criteria



FYP Workshops

No.	Title	Facilitator	Tentative Date
1.	Kickoff Briefing	Dr Kenneth Fung	8 Dec 2023
2.	Collecting Data for Action Research	Associate Prof Dr Zeeda Fatimah Mohamad	5 Jan 2024
3.	Professional Internal Communication	Dr Suzana Ariff Azizan	12 Feb 2024 (online)
4.	Tips for Academic Writing	Dr Janice Lo	8 March 2024
5.	Managing Research	Dr Kenneth Fung	5 April 2024
6.	Academic Poster Design	Dr Nurulaini Abu Shamsi	3 May 2024
7.	Presenting Research	Dr Kenneth Fung	24 May 2024
8.	FYP Symposium	All	8 June 2024

Student Selection

A total of 50 FYP Students started the programme but 1 dropped out due to unforeseen circumstances.

Based on their adherence to the Ecocampus Blueprint thrusts, they were divided into various clusters:

- Facilities
- Water
- Energy
- Mobility
- Well-being
- Waste

Student Selection

The call was open to all faculties but certain programmes were not able to participate due to programme research project attributes.

Participating faculties included:

- Faculty of Engineering
- Faculty of Science
- Faculty of Built Environment
- Faculty of Education
- Academy of Islamic Studies

Findings

No.	Phase	Activities	Findings
1.	Preparation	Brainstorming and kick-off meetings to roll out program to brief supervisors, and students.	Debate about a totally bottom-up approach versus adherence to the Ecocampus blueprint. Decision was to follow the Ecocampus blueprint to have a clear sense of direction as opposed to a more participatory approach to campus sustainability.
2.	Recruitment	Briefing with students and clarification with supervisors	Clarification was required for the use and disbursement of small grants. There was also some confusion regarding the assessment of students and to what extent does the project actually affect the status quo with the research projects. Several programmes also were found to be unsuitable for this model due to FYPs only starting in Semester 2, or may not have a research component.

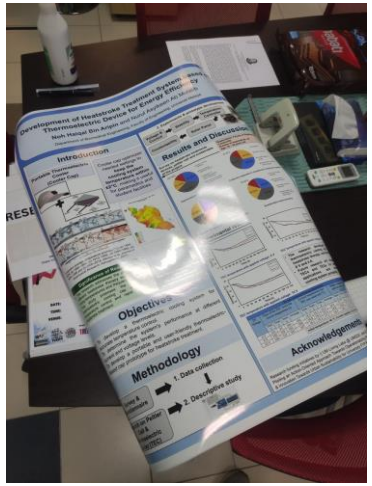
Findings

No.	Phase	Activities	Findings
3.	Selection	Screening of students	An AI model was used to map the FYP abstracts to SDGs but more work was required to produce the same model for the Ecocampus blueprint. The AI model was used to prioritize the applications prior to the manual screening of the applications. The manual screening was done in Oct 2023. And the students were notified by mid sem break for Semester 1.
4.	Implementation	Running of training modules and events	The training modules were conducted as per the schedule in Table 2. Student turnout was low for physical meetings though they were scheduled during lunch breaks with food provided. The project recommends an asynchronous approach to this component if necessary for future iterations to promote scalability. The FYP Symposium was conducted on 8 June 2024 with the event report as attached in Appendix 1.

Findings

No.	Phase	Activities	Findings
5.	Reporting	Reflection on process and lessons for future iterations	Students had other priorities and were not able to fully commit to the envisioned process. However, they appreciated the opportunity to present their work to external stakeholders and discuss expanding their research. Some students were not sure about the benefit of this project, therefore an appropriate incentive needs to be determined. Grant money was not well utilized and students were not able to access it directly as it sat in the supervisor's RMF. The initial idea was to give the amount as a prize to students for getting the application approved. But, it could be a good motivator to add it as an honorarium.

Observations



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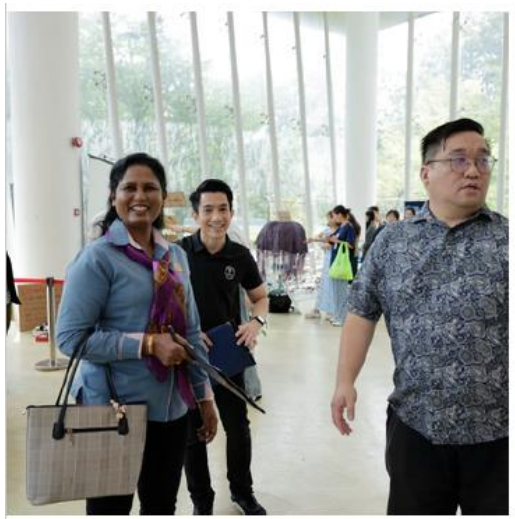

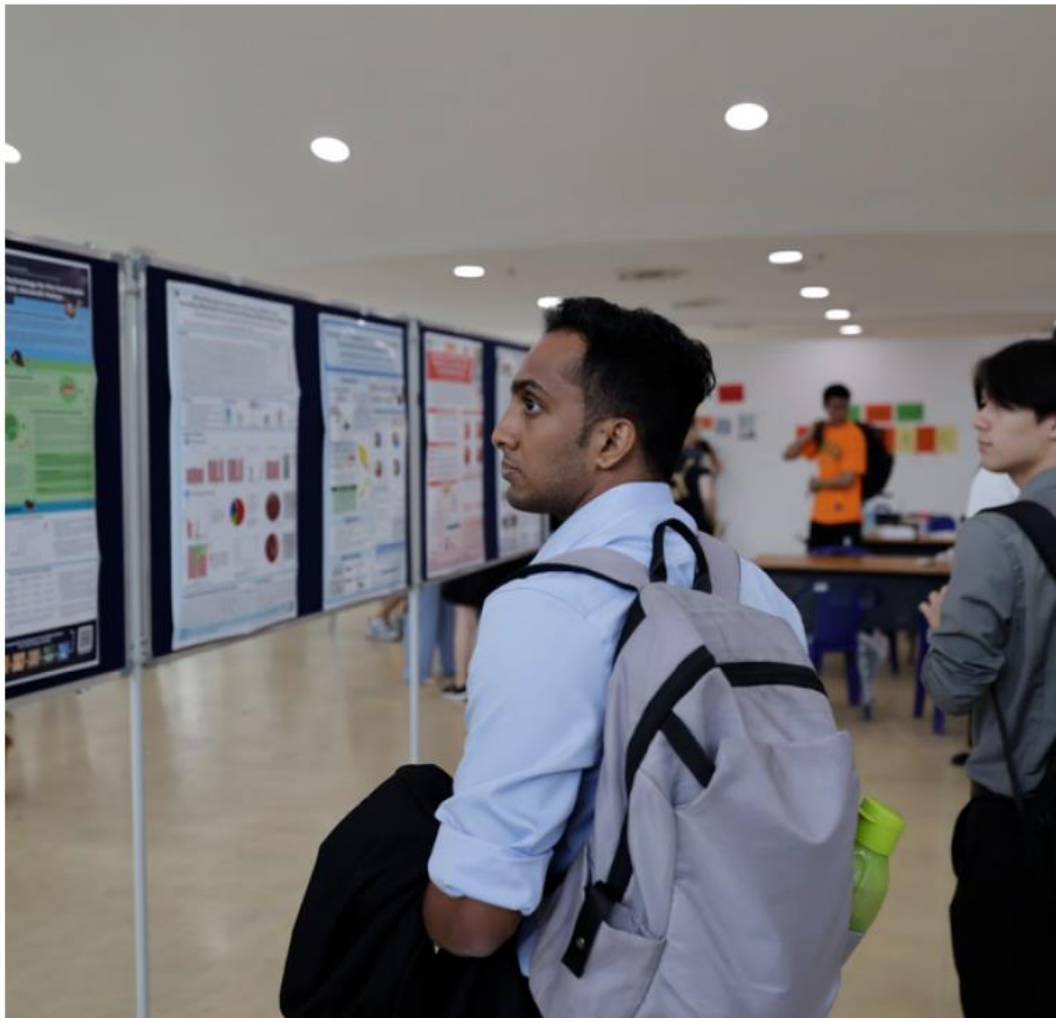

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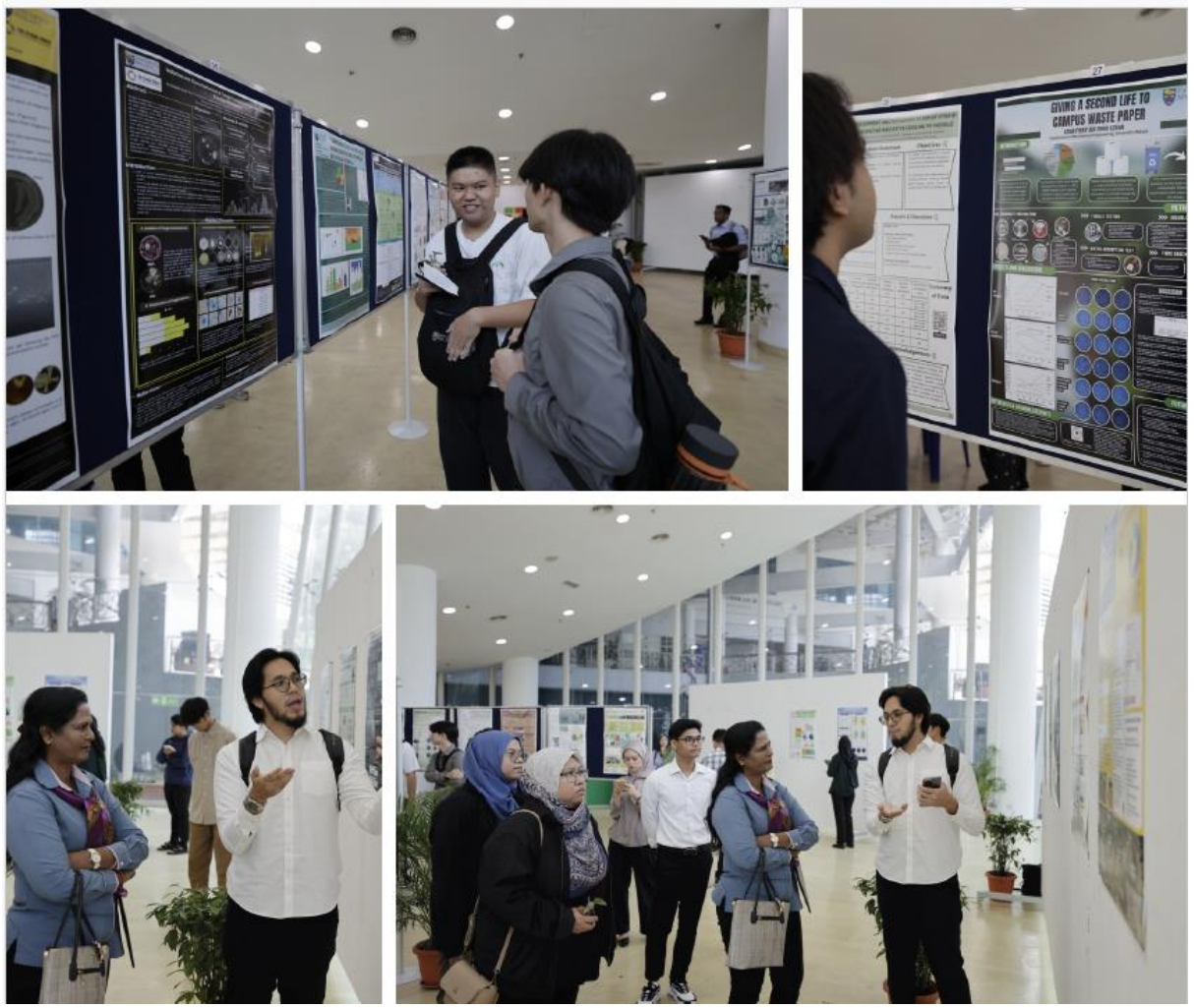

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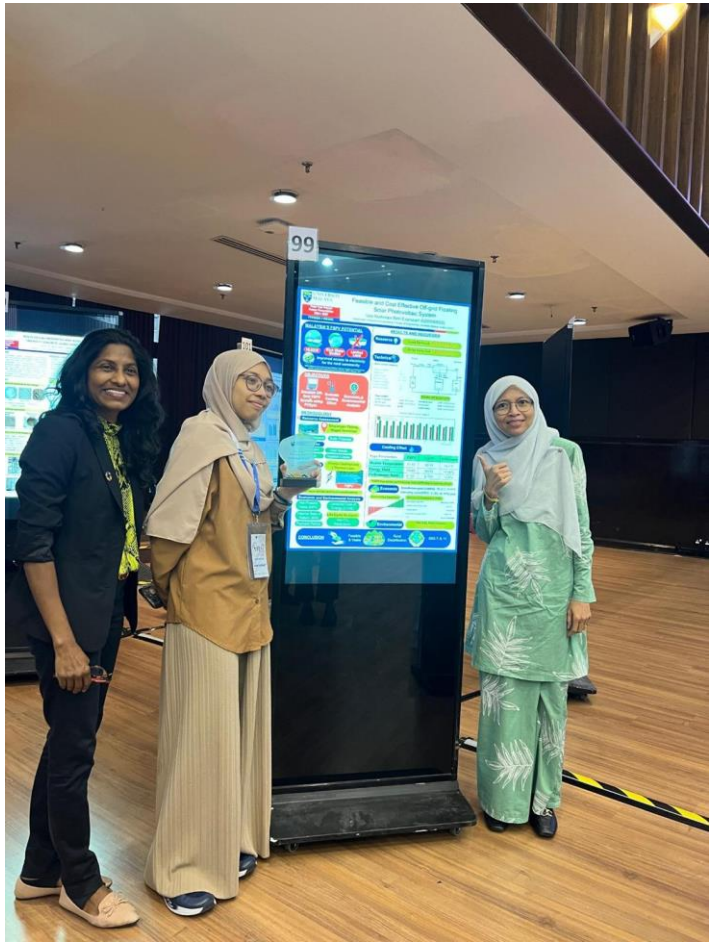

Beyond FYP SDG @ UM (FRGS)

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Overview

- Engagement with Members of Parliament in Gemas (Negeri Sembilan), Jelebu (Negeri Sembilan) and Kuala Sepetang (Perak).
- Stakeholder engagement to be done in Q4 2025 and Q1 2026 to gather community-based problems.
- Community-based problems to be shared with UM Students (and in the future, participating universities) to be turned into student research projects.

Campus Sustainability FYP Living Lab

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